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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/287,579 04/06/99 LI.

L 105-067USA00

EXAMINER

MMC2/0724

THOMAS J PERKOWSKI ESQ
SOUNDVIEW PLAZA
1266 EAST MAIN STREET
STAMFORD CT 06902

GI, Z
ART UNIT

PAPER NUMBER

2871
DATE MAILED:

07/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/287,579	Applicant(s) LI ET AL.	
	Examiner Mike Qi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr. 23, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 5, 6, 10-12 and 15-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-8, 13, 32-37, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 9, 14 and 38 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 33, 35, 36-37 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 33, the chiral additive (CB15) is commercial available from EMI;

Claim 35, the photo initiator (2,6-Di-tert-buty-4-methylphenol, IG500 or D1173) are commercial available from Aldrich and Cyba Gegy;

Claim 36, the monomer (EGD, UV10 or UV15-7) are commercially available from Aldrich and Master Bond;

Claim 37, the dichroic dyes (D5, D35 or D52) are commercially available from EMI;

Claim 40, the low molecular weight nematic liquid crystal material (K-series single compound liquid crystal, M-series single compound liquid crystal, E-series single compound liquid crystal, ZLI-series single compound liquid crystal, E7 liquid crystal, E4A liquid crystal and P9615A liquid crystal) are commercially available from EMI of Germany and SLCHEM of China;

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 32, 34 and 36 are rejected under U.S.C. 103(a) as being unpatentable over US 4,749,261 (McLaughlin et al) in view of US 5,691,795 (Doane et al) and US 5,667,897 (Hashemi et al).

Claims 1-3, McLaughlin discloses (col.4, lines 44-47; col.5, lines 28-47; col.8, lines 14-19; Figs. 2-3) that the liquid crystal sunroof (10) includes two transparent surfaces (22,24) and liquid crystal material (26) therebetween, and the circuit (25) is connected by electrical leads (21,23) to electrodes (30,32) positioned on opposite sides or surfaces of the liquid crystal material (26), and operationally, with switch (29) open or close to control the field-off state or field -on state of the light transmissive characteristics of the sunroof (10) or window (100) of the liquid crystal (26), and generally, when the liquid crystal material is in the field-on state the light should be transmission, when the liquid crystal material is in the field-off state the light should be scattering, and that the sunroof or window are glazing panel.

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McLaughlin does not expressly disclose that such glazing panel using float-glass substrates and has total-scattering and total-transmission within the solar region of the electromagnetic spectrum, and avoid the use of energy absorbing.

However, Doane discloses (col. 6, line 64- col.10, line 60, and in Figs 1-3) that the polymer-liquid crystal material (electro-optical glazing structure) is light scattering (total-scattering mode) in a field-OFF condition and optical clear (total-transmission mode) in a field-ON condition. An AC voltage source (17) controls the polymer domains in order to switch the cell between different optical states, and it does not need to use any energy absorbing mechanisms, such that the operation mode can be electrically-activated or switched, i.e., in the field-OFF condition the material is strongly light scattering (total-scattering), and when the fields are turned on the material is optically clear (total-transmission), and the cell is haze free at all viewing angles.

Hashemi discloses (col.1, lines 49-51) that float-glass processing is the conventional way of producing sheet glass, used for automotive and architectural uses, throughout the world.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a liquid crystal material interposed between a pair of float-glass substrates and switchable between the scattering mode and transmission mode as claimed in the claims 1-3 for achieving haze free at all viewing angles used as an optical glazing panel.

Claim 4, Doane discloses (col.3, line 66-col.4, line 18) that the wavelength of the light that is reflected by the material is given by the relation $\lambda=np$ (n is the average refractive index, p

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is the pitch length), and the wavelength can be above infra-red and below ultra-violet, i.e. a broad band electromagnetic spectrum of operation including the UV light, infra-red or visible light, and that was well known to tailor the band to the required application, and therefore it would have been obvious in the device of Doane to employ a wide band including near-IR, visible and near-UV in order to tailor the operation to the band required for any given application.

Claims 32, 34 and 36, Doane discloses (in Example 9) that the polymer stabilized liquid crystal material was prepared from certain amount of chiral agent, monomer and photo-initiator, i.e., the polymer stabilized liquid crystal material comprises chiral additive, photo initiator and monomer.

Therefore, it would have been obvious to those skilled in the art at time the invention was made to use chiral additive, photo initiator and monomer for forming the PSCT liquid crystal material as claimed in claims 32, 34 and 36.

5. Claims 7 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over McLaughlin, Doane and Hashemi as applied to claims 1-4, 32, 34 and 36 above, and further in view of US 6,049,366 (Hakemi et al).

Claim 7, Hakemi discloses (col.1, lines 26-63) that using PSCT (polymer stabilized cholesteric texture) has advantages: (1) haze-free normal-mode and reverse-mode shutters (compared to PDLC); (2) simplicity of fabrication by eliminating the polarizers and dyes (compares to LCD); (3) low voltage requirement (compared to PDLC); and (4) bistability (compared to LCD and PDLC), and as the concentration of polymer gel is low, there will be no

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index mismatching and the shutter in the On-state is transparent in all viewing direction (haze-free).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use PSCT liquid crystal material as claimed in claim 7 for achieving haze-free.

Claim 39, Hakemi discloses (col.19, line 23-col.20, line 22) that making a polymer stabilized liquid crystal composite containing a low molecular weight liquid crystal material, and such films can work as a reverse mode shutter and a normal mode shutter, and the transparent state is haze free for all directions of incident light.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a liquid crystal material comprises a low molecular weight nematic liquid crystal material as claimed in claim 39 for achieving bistable properties and haze free for all directions in the transparent state.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over McLaughlin, Doane, Hashemi and Hakemi as applied to claims 1-4, 32, 34, 36 and 7 above, and further in view of US 6,172,720 (Khan et al).

Claim 8, Khan discloses (col.1, lines 17-61) that the stabilized cholesteric liquid crystals have high viscosity which can undesirably increase the response time of these materials when used in electrooptic devices, and exhibits no liquid crystalline phase (no mesogenic group) will substantially lowers the viscosity of the liquid crystal material, so as to improve the properties such as higher contrast ratio, shorter response time and lower voltages.

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Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a polymer lacking the mesogenic group as claimed in claim 8 for achieving haze-free, shorter response time and wide viewing angle.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over McLaughlin, Doane and Hashemi as applied to claims 1-4, 32, 34 and 36 above, and further in view of US 5,570,216 (Lu et al) and US 5,667,897 (Hashemi et al).

Claim 13, Lu discloses (col.2, lines 42-52) that using glass for the substrate (12) and coating a conductive material as an electrode (20) on the glass, e.g., ITO (Indium Tin oxide), and inherently, disposed an insulating layer on top of the electrodes for insulating the electrode.

Hashemi discloses (col.1, lines 49-51) that float-glass processing is the conventional-way of producing sheet glass, used for automotive and architectural uses, throughout the world.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use float-glass substrate with insulation layer and a conductive layer as electrode as claimed in claim 13.

Allowable Subject Matter

8. Claims 9, 14 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art of record neither discloses nor teaches that an eletro-optical glazing structure comprises various elements, more specifically, as the following:

the PSCT liquid crystal material comprises dichroic dyes [claim 9];

the liquid crystal material comprises a surfactant which eliminates liquid crystal flow streaks [claim 14];

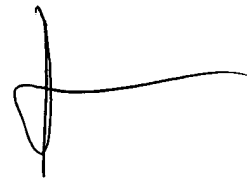
the surfactant comprises Poly(Dimethylsiloxane) [claim 38].

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703)308-6213 .

Mike Qi
July 13, 2001

A handwritten signature in black ink, appearing to be 'K Parker', with a long horizontal stroke extending to the right.

**KENNETH PARKER
PRIMARY EXAMINER**